

*Meteorological Record for the Cotton Districts for the month of August, 1882.*

DISTRICTS.	Average rain-fall in inches.	Mean of the maximum.	Mean of the minimum.
New Orleans .....	8.88	89.8	72.0
Savannah .....	6.21	90.6	71.0
Charleston .....	6.12	90.4	68.9
Atlanta .....	5.99	87.7	67.5
Wilmington .....	6.24	87.8	67.5
Memphis .....	4.30	87.1	67.2
Galveston .....	5.42	87.7	70.2
Vicksburg .....	4.66	89.1	68.7
Montgomery .....	4.01	88.6	68.7
Augusta .....	4.26	88.4	68.8
Little Rock .....	3.44	88.3	68.3
Mobile .....	3.96	90.2	70.0

*Meteorological Record for the Cotton Districts for the month of July 1882.*

DISTRICTS.	Average rain-fall in inches.	Mean of the maximum.	Mean of the minimum.
New Orleans .....	8.30	90.4	71.3
Savannah .....	6.21	91.0	70.3
Charleston .....	7.28	90.9	68.0
Atlanta .....	5.46	87.9	67.6
Wilmington .....	5.90	90.2	67.7
Memphis .....	5.45	88.0	67.1
Galveston .....	3.74	94.0	71.3
Vicksburg .....	10.30	89.4	69.0
Montgomery .....	5.18	88.6	67.1
Augusta .....	4.93	90.0	69.2
Little Rock .....	3.08	89.2	66.0
Mobile .....	6.06	90.5	68.7

*Meteorological Record for the Cotton Districts for the month of June, 1882.*

DISTRICTS.	Average rain-fall in inches.	Mean of the maximum.	Mean of the minimum.
New Orleans .....	2.43	90.6	72.5
Savannah .....	4.97	89.9	70.4
Charleston .....	4.98	89.9	67.5
Atlanta .....	3.85	88.6	66.8
Wilmington .....	1.97	90.0	66.2
Memphis .....	2.89	90.4	67.0
Galveston .....	0.90	92.7	70.0
Vicksburg .....	1.44	91.2	68.5
Montgomery .....	3.49	91.5	69.4
Augusta .....	4.06	90.6	67.6
Little Rock .....	1.58	91.3	64.2
Mobile .....	2.60	94.8	68.5

*Meteorological Record for the Cotton Districts for the month of May, 1882.*

DISTRICTS.	Average rain-fall in inches.	Mean of the maximum.	Mean of the minimum.
New Orleans .....	5.57	84.4	61.1
Savannah .....	2.59	84.8	60.7
Charleston .....	2.53	81.9	58.1
Atlanta .....	2.39	78.9	56.2
Wilmington .....	2.62	79.0	54.6
Memphis .....	7.56	77.7	56.3
Galveston .....	5.25	83.9	59.9
Vicksburg .....	7.03	81.9	60.8
Montgomery .....	3.02	81.9	58.2
Augusta .....	2.11	82.2	57.8
Little Rock .....	11.04	78.7	53.6
Mobile .....	4.69	83.4	58.3

*Meteorological Record for the Cotton Districts for the month of April, 1882.*

DISTRICTS.	Average rain-fall in inches.	Mean of the maximum.	Mean of the minimum.
New Orleans .....	5.63	81.9	59.9
Savannah .....	3.73	81.1	60.2
Charleston .....	2.66	77.5	54.5
Atlanta .....	4.49	76.3	54.9
Wilmington .....	3.88	74.2	50.0
Memphis .....	5.29	74.9	54.0
Galveston .....	1.58	82.1	57.9
Vicksburg .....	7.03	78.6	56.8
Montgomery .....	4.92	78.5	57.2
Augusta .....	3.05	78.2	54.7
Little Rock .....	4.74	75.9	51.9
Mobile .....	8.80	79.1	57.3

## WINDS.

The prevailing direction of the winds during the month of August at Signal Service stations are shown on chart number ii., by arrows flying with the wind. Throughout the country east of the Rocky mountains the prevailing winds were, with but few exceptions, from southeast to southwest, except in the upper lake region, upper Mississippi and lower Missouri valleys, where they were mostly northerly; in the north Pacific

coast region they were northerly, and in the middle and south Pacific coast regions they were westerly.

## TOTAL MOVEMENTS OF THE AIR.

[In miles.]

The following are the largest total movements at the Signal Service stations: On the summit of Mount Washington, 17,255; Cape Mendocino, California, 12,842; Hatteras, North Carolina, 9,693; San Francisco, 9,160; Delaware Breakwater, 8,804; Barnegat, New Jersey, 8,522; Kittyhawk, North Carolina, 8,456; Sandy Hook, New Jersey, 8,383. The smallest are: Lynchburg, Virginia, 1,911; Silver City, New Mexico, 2,017; Yankton, 2,093; Augusta, Georgia, 2,234; Olympia, 2,258; Fort Missoula, Montana, 2,480; Fredericksburg, Texas, 2,594; Roseburg, Oregon, 2,596; Vicksburg, 2,596; San Antonio, Texas, 2,620; Washington, District of Columbia, 2,633; Lewiston, Idaho, 2,651; Little Rock, Arkansas, 2,719; Boise City, Idaho, 2,720; Tucson, Arizona, 2,727; Shreveport, 2,754; Dayton, 2,773; Montgomery, 2,835; Morgantown, West Virginia, 2,841; Indianapolis, 2,985.

## HIGH WINDS.

The highest velocity recorded during the month (80 nw.) occurred on the summit of Mount Washington, on the 13th. At this station other high velocities occurred as follows: 63, w., 7th; 54, w., 8th; 51, sw., 9th; 55, sw., 10th; 60, nw., 11th; 57, nw., 12th; 66, nw., 14th; 70, nw., 15th; 68, nw., 17th; 66, nw., 18th; 57, nw., 19th; 65, n., 25th. Stations reporting velocities of forty miles per hour or more are as follows: Galveston, Texas, 49, nw., 4th; Olympia, Washington territory, 48, sw., 1st; Eagle Rock, Idaho, 48, s., 1st; West Las Animas, Colorado, 48, n., 28th; Fort Washakie, Wyoming, 46, sw., 17th; Fort Assinaboine, Montana, 44, sw., 16th; Indianola, Texas, 43, ne., 9th; Fort Keogh, Montana, 40, se., 17th; Umatilla, Oregon, 40, w., 15th; Salt Lake City, Utah, 40, se., 1st.

## LOCAL STORMS.

*Connecticut:* 7th. A severe storm occurred at Stamford, Fairfield county, causing much damage. Several buildings were struck by lightning and were more or less damaged.

*Colorado:* West Las Animas, 28th. A heavy gale occurred at 3:35 p. m., and lasted three hours. The wind reached a velocity of forty-eight miles per hour.

*Dakota:* Wicklow, 14th. Several buildings were blown down during a heavy wind storm which occurred about twenty-five miles south of station.

*Kansas:* Sterling, 15th. A violent wind-storm accompanied by thunder and severe hail, occurred on the evening of the 15th. Many buildings were unroofed and otherwise damaged and several smoke stacks were demolished. During the storm two inches of rain fell, which greatly benefited the corn crop. A severe thunder storm also occurred in Nemaha and Marshall counties on the morning of the same day; many buildings were damaged by lightning.

Russell, 27th. A whirlwind occurred at 10.35 p. m.; the cloud had a rapid revolving motion and moved from the southwest; it was apparently fifty feet in diameter, and about seventy feet in height. On striking the town, the phenomenon appeared to bound upwards carrying dust and debris with it until it appeared to be about two miles high, when it assumed the form of huge revolving ball. It was immediately preceded and followed by a dead calm.

*Louisiana:* New Orleans, 9th. During a heavy gust of wind the Crescent City cotton press was unroofed, and other damage occurred in the city.

*Maine:* Bangor, 15th. A destructive wind storm, accompanied by torrents of rain occurred at Bangor on the above date. Many buildings were blown down and others unroofed, while hundreds of chimneys were demolished. The spire of the Unitarian church was blown down, and several buildings were damaged by lightning. Many cellars were flooded and merchandise was considerably damaged by water. The storm was purely local and extended over a small section only. The damage to crops and property is estimated at \$50,000. At

4 p. m. of the same day, a violent wind and rain storm occurred at Dexter; no damage was reported.

*New Jersey*: Freehold, 8th. A severe storm occurred during the evening. No damage was done in the town, but in the adjacent townships, several barns and other buildings were damaged. The path of the storm was from southwest to northeast. A storm, accompanied by thunder and lightning occurred at Long Branch at 4 p. m. of the 7th. No serious damage was reported.

*Ohio*: A severe storm, accompanied by hail, occurred in Huron county on the 8th; growing crops were cut down and many gardens were ruined. Reports from several sections in northern Ohio state that the storm was very severe and caused considerable damage to crops and other property.

*Pennsylvania*: A severe wind and rain storm visited the Cumberland valley on the night of the 6th. Much damage was done by floods. (see Floods).

*Rhode Island*: A tornado occurred near Olneyville, Johnson county, on the 24th. One barn was unroofed and several dwellings were more or less damaged; many large trees were uprooted.

*Wisconsin*: Milwaukee, 3d. A severe thunder-storm occurred on the morning of the 3d, and was accompanied by heavy rainfall, causing much damage by floods (see Floods). Several buildings were struck and damaged by lightning during the storm. A storm also occurred on the 7th, which caused some damage outside of the city; many trees being blown down. Madison 15th, a violent storm, accompanied by heavy rain, thunder and lightning, occurred during the evening of the 14th, and continued until the morning of the 15th. The storm was accompanied by hail, which caused great damage to crops. The water rose rapidly, flooding bottom-lands and sweeping away a railroad bridge.

## VERIFICATIONS.

### INDICATIONS.

The percentages of verifications of indications for the month of August will be published in the September number of the REVIEW.

### CAUTIONARY SIGNALS.

Thirty-five cautionary signals were displayed during the month of August, of which eighteen, or 51.4 per cent, were justified by winds of twenty-five miles, at or within one hundred miles of the station. No off-shore signals were displayed during the month.

Seventy-five winds of twenty-five miles, or more, per hour, were reported, for which no signals were ordered; many of these were local storms or strong sea-breezes.

## NAVIGATION.

### STAGE OF WATER IN RIVERS.

In the table on the right-hand of chart iii., are given the highest and lowest stages of water observed at Signal Service stations during the month of August 1882. In the first column of this table are given the heights of water on the gauge, which have been found dangerous to property. The water did not approach the danger line in any of the rivers during the month. The Mississippi reached its highest stage at Dubuque, Davenport, Keokuk, Vicksburg and New Orleans, on the 1st; at LaCrosse and Cairo on the 8th and 9th; at Memphis, on the 11th; and at Saint Paul on 27th and 28th. The Missouri, reached its highest stage, from the 1st to 3d. The Ohio, was highest at Pittsburg and Cincinnati, on the 29th, and Louisville on the 2d, 3d and 13th.

### FLOODS.

The excessive rainfall in Kentucky, Ohio, Wisconsin, and in parts of Texas, has caused damaging floods in these sections of the country and has seriously checked harvesting operations. The following reports of the most destructive floods are given:

*Arizona*: Serious washouts occurred on the 24th along the Southern Pacific railroad between Casa Grande and Yuma.

*Colorado*: Heavy rains occurred in various sections of the state during the 3rd and 4th, causing damaging floods. At Black Hawk, Gilpin, county, a land-slide, caused by the heavy rain, destroyed two houses and damaged a large portion of the Colorado Central railroad track. The Purgatoire river overflowed its banks and inundated the entire valley; several farm houses were swept away and crops entirely ruined. An overflow at the Cache-La-Poudre river also destroyed a number of farms and about \$10,000 worth of crops. Serious washouts occurred on the Rio Grande railroad.

*Indiana*: Vevay, 1st. Heavy rains caused creeks to overflow damaging crops, bridges, and fences to the amount of \$10,000.

*Kentucky*: Millersburg, 1st. The heavy rains of July 31st, caused much damage at this place. Hundreds of acres of corn were damaged, potatoes were washed out, and haystacks swept away. The Bowen coal mine was inundated, the miners barely escaping with their lives. The loss of crops along the Licking river, between Falmouth and Livinggood, a distance of four miles, is estimated at \$30,000; in addition to this, much stock was drowned. The losses at other points along the river were equally heavy. Heavy rains fell in the northern and central parts of the state during the 3d, causing streams to rise above their banks and doing more or less injury to crops.

*Michigan*: Heavy rains fell in the various sections of the state from the 1st to 4th, causing more or less damage; bottom lands were flooded and considerable damage was done to standing wheat. Between Ionia and Grand Rapids, the floods were very severe and caused much loss of property.

*Ohio*: 1st. Heavy rains in central Kentucky caused a rapid rise in the Licking river, which resulted in great destruction of river craft and other property. Many houses and much farm property along the banks were destroyed, and large quantities of logs, trees, debris of houses and farm produce, with various other kinds of drift, were swept down by the current. At Cincinnati harbor, the river craft were seriously damaged, several steamers were driven from their moorings and were more or less injured; seven laden barges were sunk while many sustained great damage. The loss to river property was estimated at \$60,000. The Ohio river rose nineteen feet above low-water mark, the rise being wholly due to the flood in the Licking. At Maysville several cabins were washed away, and some of the inmates were drowned. In Richland county, heavy rains during the 3d and 4th, flooded the bottom lands and caused much damage to crops. In Perry county a flood occurred in the valley between Rendville and Corning; houses, barns and stock were carried away, and crops were completely ruined. Much damage was done to the track of the Ohio Central railroad; many bridges were undermined and all communication was cut off. In Stark county, many railroad bridges were swept away or undermined, and the tracks and road-beds of the various railroads sustained considerable damage, interrupting all travel. In Sandusky county the rain caused serious damage; acres of grain were flooded and much stock and fencing were carried away. Several railroad bridges were undermined and the tracks much damaged. At Millersburg, Holmes county, the water flooded the lowlands, doing great damage to crops. Railroad tracks were washed out and travel was delayed for several days. At Marietta, the Muskingum river rose rapidly during the night of the 3d and 4th, causing a gap of one hundred fifty feet in the dam. Nine coal-laden barges were lost. At Newcomers-town, Tuscarawas county, the rain of the 3d was of short duration only, but during its prevalence an immense volume of water fell. All streams rose rapidly; the water covered many acres of corn and meadow-land, sweeping away fences and destroying a quantity of hay; several houses were more or less damaged. At Orrville, Wayne county, the floods caused much damage to railroads, crops, and other property. The village of Fairview was inundated, many of the inhabitants being compelled to leave their homes. In Wood county the water caused immense damage to crops, especially to oats; the country between Bowling Green and Tontogany was com-